## Elimination

Elimination of contestants from a live IQ contest on a TV channel is decided in phases.
Initially at phase $0, N$ contestants, where $N=2^{n}, n<10$, are selected through a special online IQ contest in which a total of $M(M>N)$ contestants participate. The contestants are identified by distinct registration numbers $1,2, \ldots, M$. The selected contestants are ranked distinctly from 1 to $N$ according to their performance in the online contest. They are qualified to participate in the live contest.

In the $p^{\text {th }}$ phase, $p=1,2, \ldots, n, K_{p}$ contestants participate in the live contest, where $K_{p}=2^{n-p+1}$. On the basis of response to questions presented during the show, $K_{\mathrm{p}} / 2$ of $K_{\mathrm{p}}$ contestants are ranked distinctly from 1 to $K_{p} / 2$. These $K_{p} / 2$ contestants qualify to participate in the next phase. At the $n^{\text {th }}$ phase there are only two contestants and the one selected at this phase is the winner of the contest.

You are required to write a program that identifies the winner of the contest, given the following information:

- INFO_1: Registration numbers of $N$ contestants who are selected through the online IQ contest, in order of the rank in the online IQ contest, and
- INFO_2: A total of $N-1$ qualified contestants in different phases; $K_{2}$ in phase $1, K_{3}$ in phase $2, \ldots$, and $K_{n+1}$ in phase $n$. Qualified contestants of different phases appear in order of phases, i.e., phase 1, phase 2, ... , phase $n$. Further, qualified contestants in a phase, say phase $p$, appear in the order of the rank in the phase, i.e., the rank in phase $p$. A qualified contestant of a phase, say phase $p$, is identified by his/her rank in the previous phase, i.e., in phase p-1.


## Input

Input may contain multiple test cases. For each case there are two input lines.
The first line gives $N$ integers representing INFO_1 while the second line gives $N$ - 1 integers representing INFO_2.

In each input line integers are separated by space. The input terminates with a line containing 0 as input.

## Output

For each test case there is only one output line. The line prints the registration number of the winner of the contest.

## Sample Input

## Sample Output

